

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)



REC'D 22 JUL 2004

| | | |
|---|--|--|
| Applicant's or agent's file reference 2313-101 | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) | |
| International application No. PCT/CA 03/00593 | International filing date (day/month/year) 23.04.2003 | Priority date (day/month/year) 23.04.2002 |
| International Patent Classification (IPC) or both national classification and IPC B09C1/02 | | |
| Applicant SONIC ENVIRONMENTAL SOLUTIONS INC. et al. | | |

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
 - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

- This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

| | |
|---|---|
| Date of submission of the demand 21.11.2003 | Date of completion of this report 21.07.2004 |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | Authorized Officer Voutsadopoulos, K Telephone No. +49 89 2399-2922  |

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/CA 03/00593**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-42 as originally filed

Claims, Numbers

1-36 as originally filed

24-36 received on 04.03.2004 with letter of 13.02.2004

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/CA 03/00593**

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------------|
| Novelty (N) | Yes: Claims | 1-32,35,36 |
| | No: Claims | 33,34 |
| Inventive step (IS) | Yes: Claims | 1-32,35,36 |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | 1-36 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/CA 03/00593

Reference is made to the following document:

D1: US-A-4 151 067 (H. GROW) 24 April 1979 (1979-04-24)

D2: WO 97/14765 A (MOBIL OIL) 24 April 1997 (1997-04-24)

I. Basis of the report.

1. The amendments to claim 33 filed with the letter dated 13.02.2004 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The application as filed discloses the use of a molten sodium containing alkali metal and not any metal.

The following reasoned statement is issued based on the originally filed claims 1-36.

2. The feature of using molten sodium containing alkali metal appears to be an essential feature to meet the requirement of processing at low temperature (see the description page 7 line 17 to page 8, line 26). Yet this feature is not comprised in the independent method claim 1 (Art. 6 PCT).

The following reasoned statement is issued on the assumption that claim 1 is amended to remove this deficiency.

V. Reasoned statement under Article 35(2).

1. Notwithstanding the objection in I.2 above, the prior art available (see for instance document D2, the claims) does not disclose treating the liquid, with the PCB dissolved therein, with molten sodium containing alkali metal. This step achieves low temperature chemical destruction of PCBs and is not fairly suggested in the rest of the available prior art.

Accordingly, the subject-matter of claim 1 meets the requirements of Art. 33(2) and 33(3) PCT.

2. Claims 2-32 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
3. The subject-matter of original claim 33 cannot be regarded as new over the apparatus known from document D1 (see column 2, line 50 to column 4, line 64; the figure), which although not intended for use in connection with PCBs, comprises all the technical features of the claim.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/CA 03/00593

The same applies to the additional features of original claim 34.
Thus, claims 33 and 34 do not meet the requirements of Art. 33(2) PCT.

4. The particular construction of the apparatus according to claims 35 or 36 is not disclosed or fairly suggested in the available prior art. The specific combinations of features are moreover not regarded as obvious in view of the general knowledge of the skilled person.
Accordingly, claims 35 and 36 meet the requirements of Art. 33(2) and 33(3) PCT.

24. The method of claim 14 wherein said treated separated sonicated fluid is recycled for use as said fluid in said method.
- 5 25. The method of claim 1 wherein said sonicating step uses sonication equipment without grinding media.
26. The method of claim 1, wherein said sonicating step occurs in a temperature range of 100-120 °C.
- 10 27. The method of claim 5, wherein said sonicating step occurs in a temperature range of 80-98°C.
28. The method of claim 1, wherein said sonicating step uses a resonating probe contacting said fluid.
- 15 29. The method of claim 1, wherein said sonicating step takes place in one or more chambers mounted axially to a resonating member.
- 20 30. The method of claim 1, wherein said liquid hydrocarbons contain one or more hydrocarbon subcomponents which are not liquids at sonication temperature.
- 25 31. The method according to claim 4, wherein said sonicating step occurs at a minimum temperature of 100°C.
32. The method according to claim 1, wherein said sodium-containing alkali metal is commercially pure sodium metal.
- 30 33. An apparatus for treating polychlorinated biphenyl (PCB) contaminated media, comprising:
- 35 a) a reaction vessel for holding a mixture of said media, a liquid hydrocarbon-containing fluid, and a molten sodium-containing metal;
- b) a sonicator without grinding media for sonicating said mixture at an audio frequency; and
- c) a heater for controlling the temperature of said mixture

and maintaining said molten sodium-containing metal in a molten state.

34. The apparatus of claim 33, wherein said sonicator uses a resonating probe contacting said mixture.

35. The apparatus of claim 33, wherein said reaction vessel consists of one or more chambers mounted axially to a resonating member of said sonicator.

36. The apparatus of claim 33, wherein said reaction vessel includes vents to release gas during sonication.